Polarity®

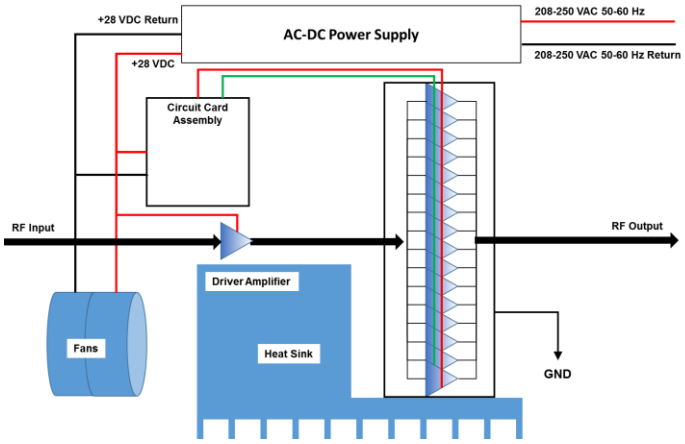
P250W33.5-36CP

General Description

The P250W33.5-36GCP SSPA is a high power, broadband, solid state power amplifier housed in an EIA compatible 3U height rack mountable chassis. The amplifier incorporates a wide input range AC – DC power supply, fan–forced convective thermal management, and an internal driver amplifier. The amplifier is appropriate for high–power wide–band testing, communications, radar, or any application requiring capability for simultaneous power amplification of signals across the 33.5 – 36.0 GHz spectrum.

The P250W33.5-36GCP incorporates high efficiency GaN MMICs, spatially combined in a compact structure to achieve robust, high performance power amplification across the 33.5 – 36.0 GHz frequency range.

Functional Block Diagram



Product Features

- 33.5 – 36.0 GHz
- 250 Watts saturated output power, CW
- 62 dB small signal gain
- 54 dB nominal power gain
- 208 – 250 VAC 47–63 Hz AC input
- Air cooling - back panel inlet and outlet
- Built in PPG - optional
- Liquid or air cooled options

Performance is typical across frequency. Please reference electrical specification table and data plots for more details.

Applications

- Radar
- Communications
- Test & Measurement
- EMI Testing

Ordering Information

Part No.	ECCN	Description
P250W33.5-36GCP	TBD	33.5 – 36.0 GHz 250 Watt Amplifier

Absolute Maximum Ratings

Parameter	Rating
RF Input Power, CW, 50 Ω, T_{CASE}=25 °C	+10 dBm
Load VSWR	3.0:1
AC Current (120, 220, 250 VAC)	8.0, 4.5, 3.8 A
Storage Air Temperature	−30 to +75 °C
Operating Air Temperature	−5 to +55 °C

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability.

Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
Voltage (V_{AC})	90	220	265	V_{RMS}
AC Frequency	47	60	63	Hz
Operating Air Temperature	0	25	50	°C
RF Input Power, CW		0		dBm

Electrical specifications are measured at specified test conditions. Specifications are not guaranteed over all recommended operating conditions.

Electrical Specifications - Simulated

Please reference data plots for more details.

Parameter	Conditions[(1)]	Min	Typ	Max	Units
Operational Frequency Range	Pulsed @ +25C Duty 50%	33.5		36.0	GHz
Output Power (P_{IN} = 0 dBm)	33.5 GHz		54.5		dBm
	34 GHz		54.7		dBm
	35 GHz		54.7		dBm
	36 GHz		54.9		dBm
	37 GHz		53.0		dBm
Power Gain (P_{IN} = 0 dBm)	33.5 GHz		54.5		dB
	34 GHz		54.7		dB
	35 GHz		54.7		dB
	36 GHz		54.9		dB
	37 GHz		53.0		dB
Small Signal Gain	33.5 GHz		54.5		dB
	34 GHz		54.7		dB
	35 GHz		54.7		dB
	36 GHz		54.9		dB
	37 GHz		53.0		dB
Small Signal Gain Flatness			See plot		dB
Input Return Loss (average)			TBM		dB
Non-Harmonic Spurious	F_0 = 33.5 – 37 GHz, P_{IN} = 0 dBm			−60	dBc
AC Input Power (average)			790	1000	W
AC Fuse	15A 250VAC 5x20mm Slow-Blow	Littelfuse 0218015.HXP or similar			

Notes:

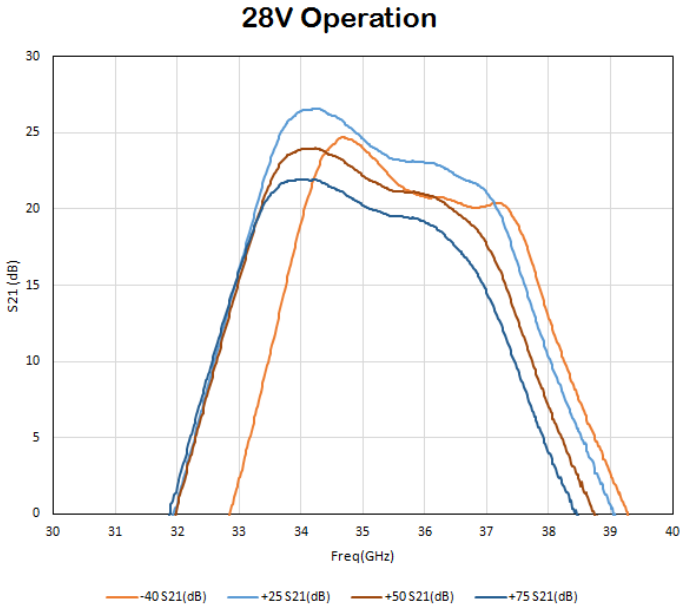
1. Test conditions unless otherwise noted: V_{AC} = 220 V_{RMS}, 60 Hz, Air Temp = +25 °C, 50 Ω system.

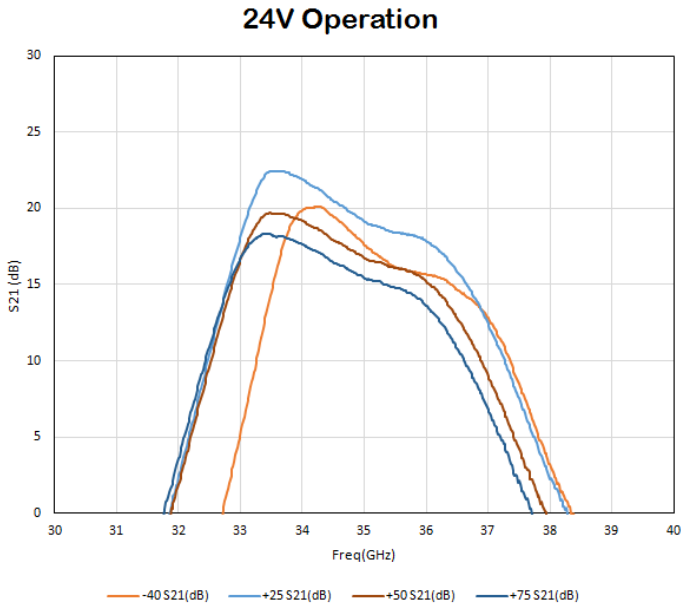
Performance Plots

Test conditions unless otherwise noted: V_{AC}=220 VAC_{RMS}, Ambient Air Temp.=+25 °C, 50 Ohm system

Unit 1 Spatium Performance

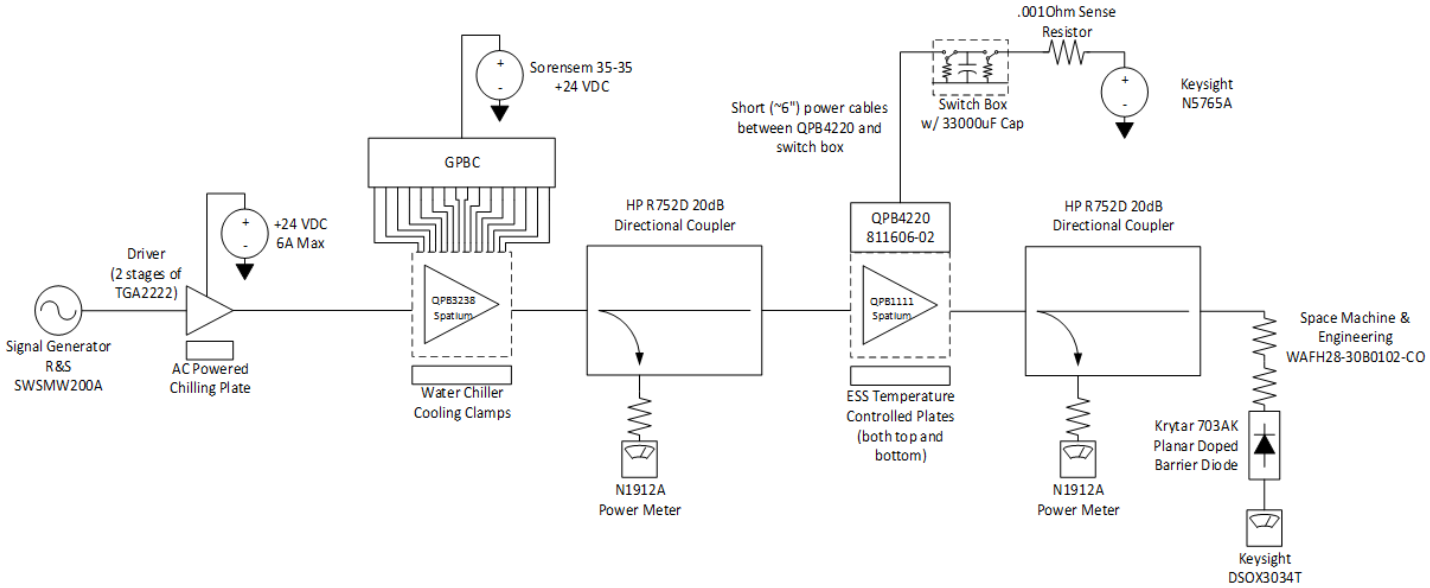
Small Signal Performance – Mag S21





Spatium Pulse Power Setup

Setup Used In Support of Measurements on Following Slides

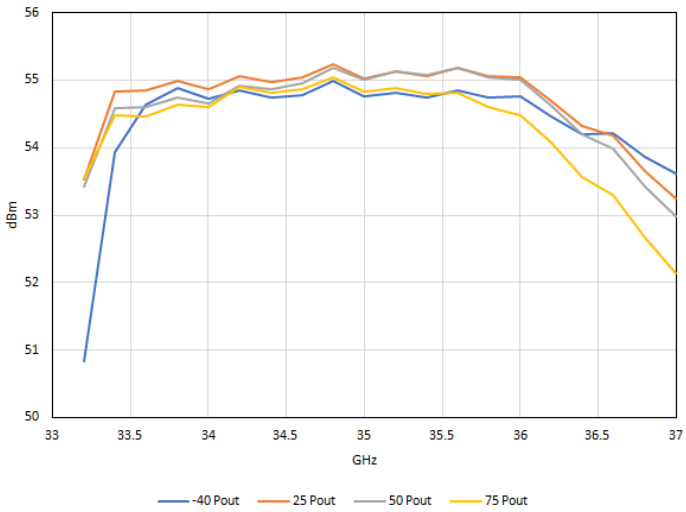


Unit 1 Spatium Performance

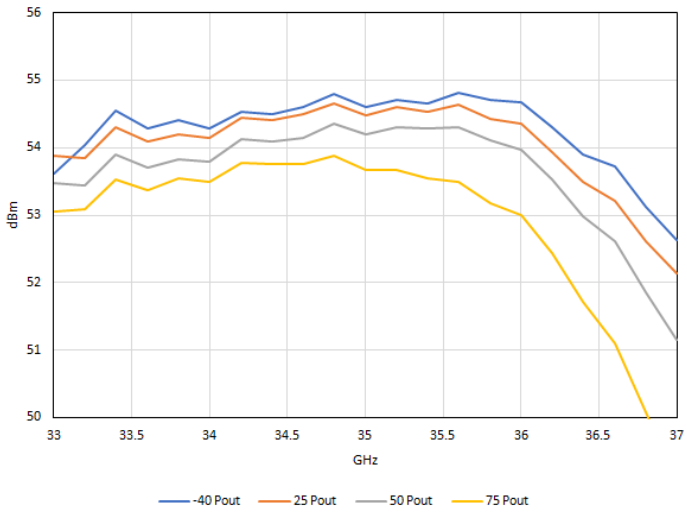
Large Signal Performance – Pout vs Temp and Vd @ 10% Duty Cycle

Pin = 39dBm with Pulse Width = 5uSec, Pulse Period = 500usec

28V



24V

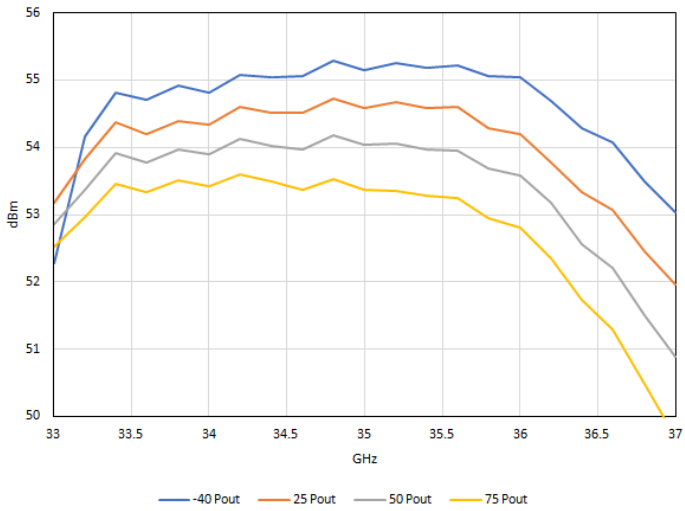


Typical Spatium Performance

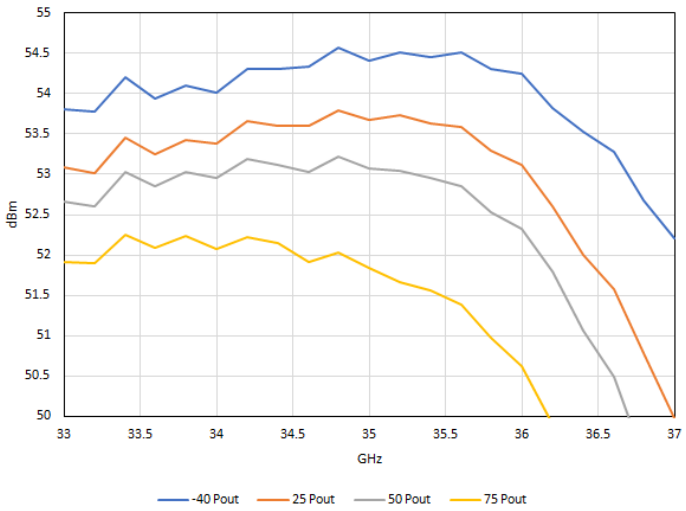
Large Signal Performance – Pout vs Temp and Vd @ 50% Duty Cycle

Pin = 39dBm with Pulse Width = 5uSec, Pulse Period = 10usec

28V



24V

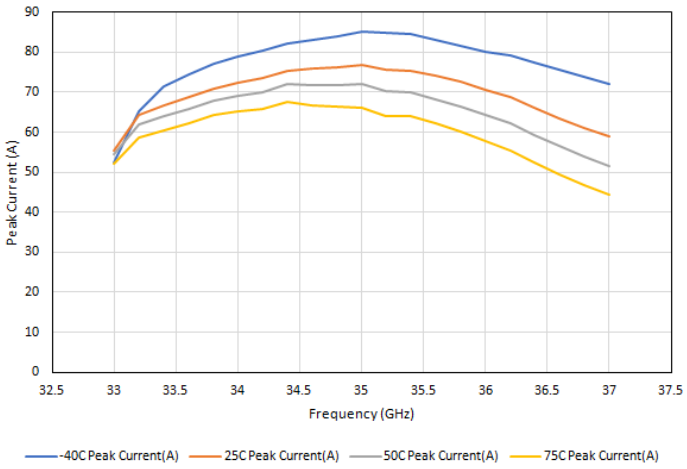


Typical Spatium Performance

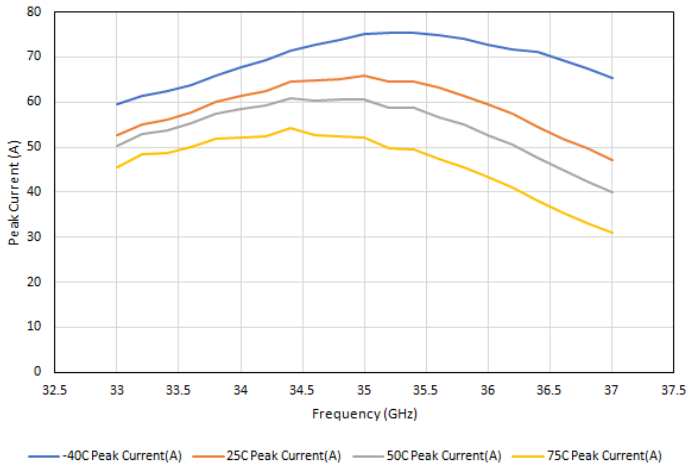
Large Signal Performance – Peak Current* vs Temp and Vd @ 50% Duty Cycle

Pin = 39dBm with Pulse Width = 5uSec, Pulse Period = 10usec

28V



24V



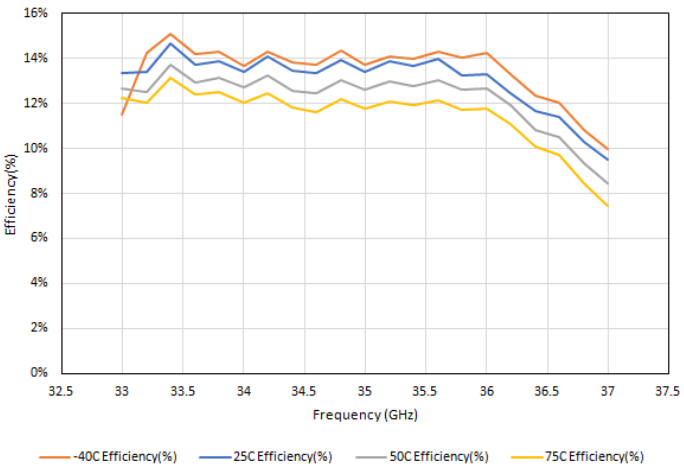
*** Peak current is calculated by weighting the Idq bias current against the time average current**

Typical Spatium Performance

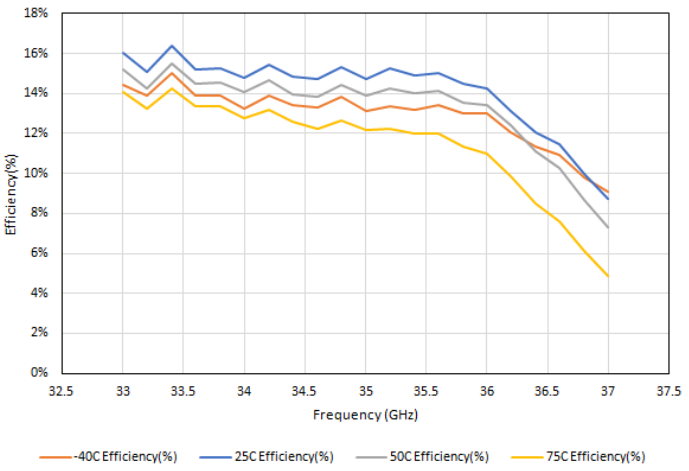
Large Signal Performance – Drain Efficiency vs Temp and Vd @ 50% Duty Cycle

Pin = 39dBm with Pulse Width = 5uSec, Pulse Period = 10usec

28V



24V



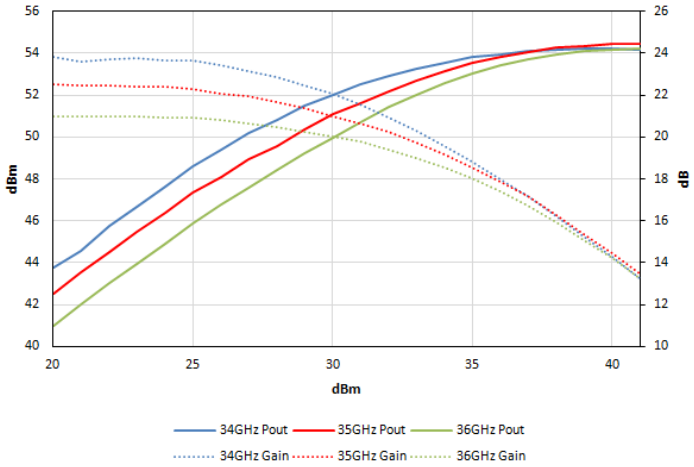
*** Peak current is calculated by weighting the Idq bias current against the time average current**

Typical Spatium Performance

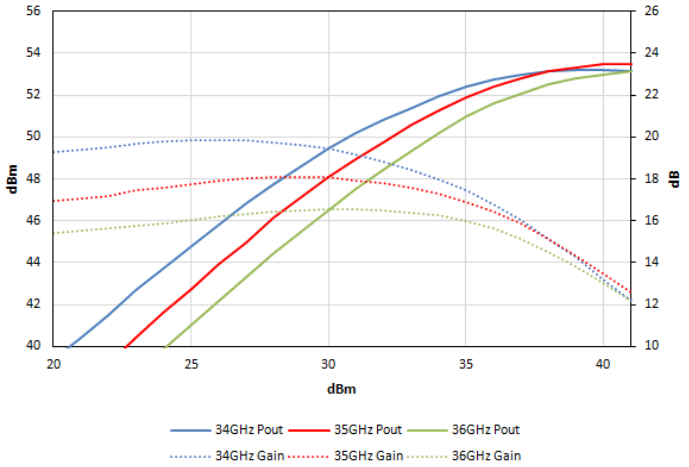
Large Signal Performance – Pout and Gain vs Pin and Vd @ 50% Duty Cycle

25C, Pulse Width = 5uSec, Pulse Period = 10usec

28V



24V

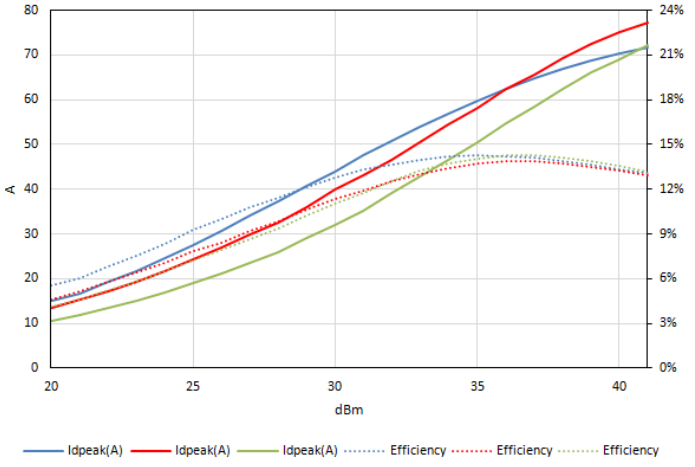


Typical Spatium Performance

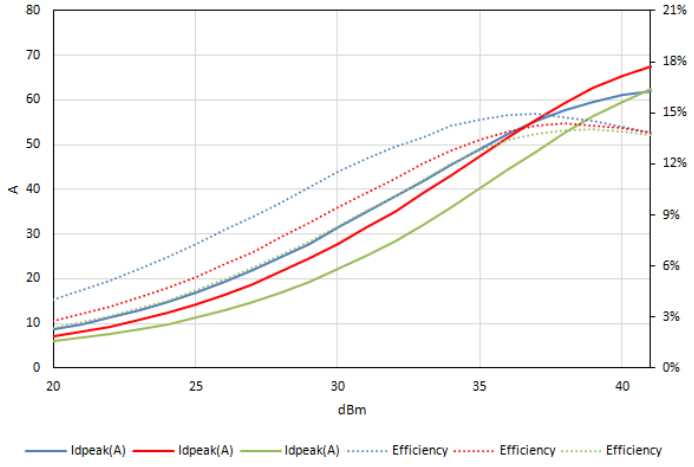
Large Signal Performance – I_{pk} and η_d vs Pin and Vd @ 50% Duty Cycle

25C, Pulse Width = 5uSec, Pulse Period = 10usec

28V



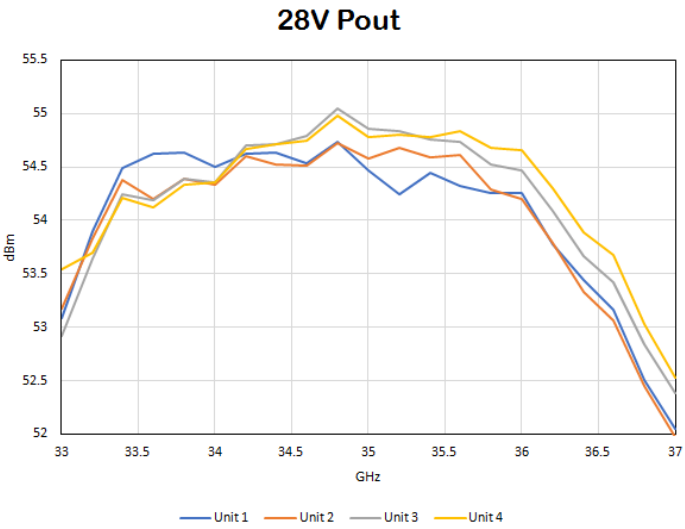
24V

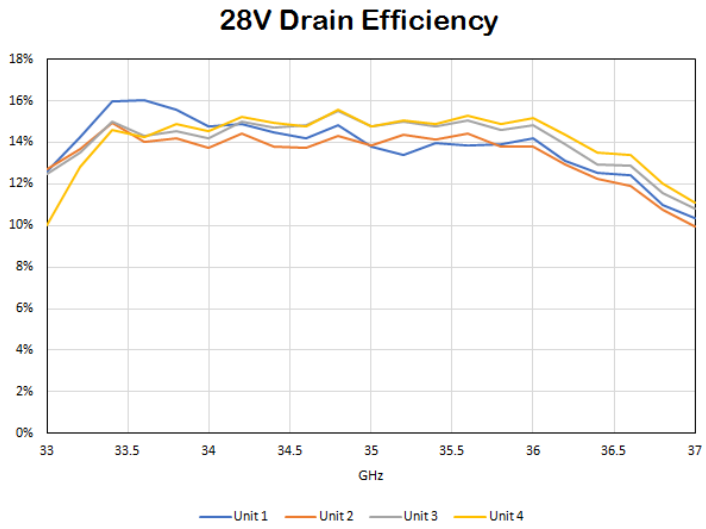


Spatium Performance Consistency

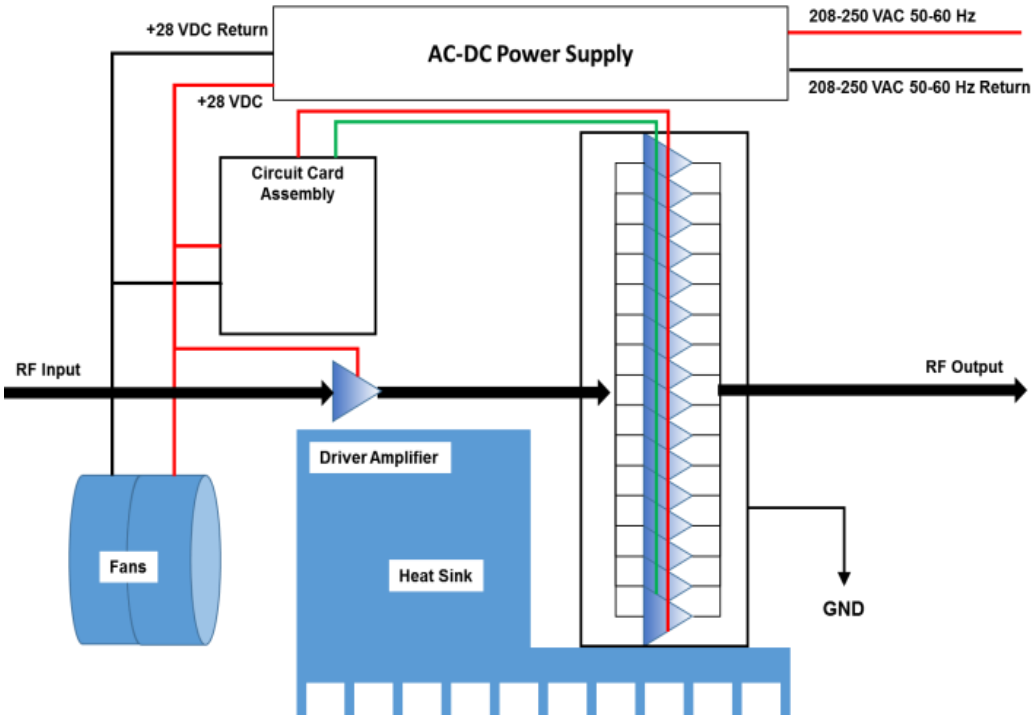
Unit-Unit Variation

25C, Pulse Width = 5uSec, Pulse Period = 10usec



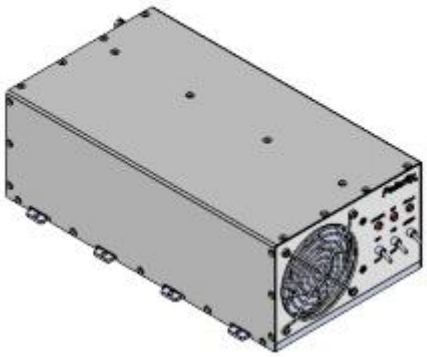


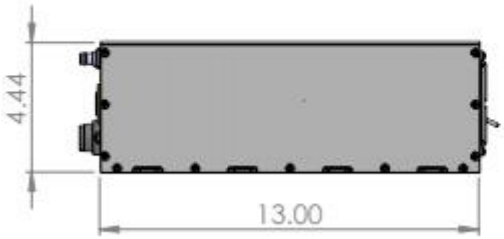
Block Diagram and Description

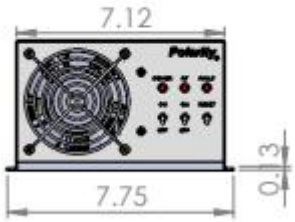


I/O Port	Label	Description
RF In	N/A	2.92 mm (F) RF Input
RF Out	N/A	WR28 High Power RF Output Waveguide
120-265 VAC	N/A	IEC 320-Standard Sheet C13 straight female connector with Retaining Clip

Package Marking and Dimensions







Handling Precautions

Caution!
ESD-Sensitive Device

Contact Information

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